Amendments to the Specification:

Please replace paragraph [009] with the following amended paragraph:

[009] In accordance with another aspect of the invention, a method of applying a coating to a titanium-based substrate ~~comprising~~ comprises applying an aluminum conversion layer of between about 2 to 12 microns on the substrate by gaseous deposition, the layer being deposited at a temperature below which aluminum does not appreciably react with titanium and below the melting point of [[Al]] aluminum; heat treating the aluminum conversion layer so the aluminum oxidizes to form alumina and interacts with the titanium to form the titanium aluminide; and the aluminum conversion layer is oxidized to form an alumina surface layer.

Please replace paragraph [012] with the following amended paragraph:

[012] In accordance with yet another aspect of the invention, a method of applying a coating to a braze for titanium, which may contain depending on the braze alloy a substantial amount of Ti, only trace amounts of Ti, or in some cases no Ti, ~~comprising~~ comprises applying an aluminum conversion layer of between about 2 to 12 microns on the substrate preferably by gaseous deposition, the layer being deposited at a temperature below which aluminum does not appreciably react with titanium or the braze and below the melting point of Al; heat treating the aluminum conversion layer so the aluminum oxidizes to form alumina and interacts with the braze either to form ~~the~~ titanium aluminide or a solid state solution diffusing into the braze leaving an alumina surface layer.

Please replace paragraph [035] with the following amended paragraph:

[035] Titanium foil 4 mil thick was selected for an evaluation of coating thickness because the effect of the coatings properties is much more pronounced on the thin foil than thick sections. Thin foil is also required for heat exchangers, with it being formed into the fins. The foil was machined to tensile and fatigue specimens with care being taken not to damage the edges of the foil. These were then degreased prior to being coated with aluminum of various thicknesses. The vapor deposition technique was chosen to deposit the aluminum and a deposition temperature of 300°C was used. The ~~coating~~ thickness of the aluminum conversion layer was varied form 5 to 40 microns by adjusting the specimen locations within the coating chamber and by carrying out additional runs for a longer duration. After ~~coating~~ deposition of the aluminum conversion layer, the specimens were heat-treated - firstly at a low temperature, ~400°C, to from an alumina layer on the surface and then at a high temperature, 700°C, to diffuse the remaining Al into the Ti to form a titanium aluminide. The aluminum conversion layer may be deposited on the titanium-based substrate at a temperature of less than about 450° C.

Please replace paragraph [041] with the following amended paragraph:

[041] At ~~lower~~ higher temperatures, X-ray showed a mixture of titanium aluminides ~~alumindes~~ are formed, but at ~700°C and below only $TiAl_3$ was present plus a significant amount of alumina.

Please replace paragraph [044] with the following amended paragraph:

[044] The tensile strength (FIG. 3) shows an increase as the temperature drops form 700 to 640°C, and it then remains relatively constant. The fatigue strength increases as the temperature decreases, surprisingly continuing to increase at the same rate even when the temperature drops below 660°C. In fact, the increase in fatigue life as the temperatur falls below 700°C

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is surprisingly greater than would be expected from the increase in tensile strength (FIGS. 4-5). Comparable good oxidation resistance was found for all the heat treatment temperatures below around ~~around~~ 700°C.

Please replace paragraph [045] with the following amended paragraph:

[045] It was also surprisingly found that if the diffusion temperature of the coating on the metal substrate was below the melting temperature of the Al, diffusion into the Ti still occurred, provided the coating process produced a good clean bond between the part and the coating. In Fig 6 a micrograph is shown for a relatively thick ~~~12 m~~ 12 μm Al coating (to better show up the Al coating) that has been heat treated at a temperature below the melting point of Al. A very thin diffusion~~-~~ or bond layer can however still be seen between the Al layer and the Ti despite the low temperature. At higher temperatures, above the melting point of Al, the outside surface is denser and more clearly defined than in Fig. 6, and the alumina layer is more clearly visible. The micrograph of Fig. 6 shows both surfaces of the Ti foil to illustrate another advantage of the thin Al layer herein described. Thicker layers it can be seen would effectively be comparable in total thickness to the Ti foil, which ~~of course~~ is undesirable from the point of view of heat exchanger design ~~exchanger's designer point of view is undesirable~~.